

学校编码: 10384

分类号\_\_\_\_\_密级\_\_\_\_\_

学号: 31320080150306

UDC\_\_\_\_\_

厦门大学

博士学位论文

低碳视角下中国经济增长问题研究

A Study on China Economy Growth Issue from  
Low Carbon Perspective

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论文提交日期: 2012 年 4 月

论文答辩时间: 2012 年 6 月

学位授予日期: 2012 年 月

答辩委员会主席: \_\_\_\_\_

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2012 年 月

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## 摘 要

保证经济增长一直是中国宏观经济运行的核心目标。2011 年中国人均 GDP 已经超过 4000 美元，中国正处在跨越“中等收入陷阱”的关键时期。虽然城市化进程可以成为现阶段推动经济增长的主要动力，但是产业结构重工业化、能源需求刚性增长、能源效率偏低以及能源结构以煤为主等阶段性特征将成为当前经济增长过程中很难回避的问题。

若没有与二氧化碳排放相关的气候问题，中国经济增长的阶段性问题可能将同历史上发达国家经历的过程相似。然而，二十一世纪第一个十年，中国二氧化碳排放量增长超过了一倍，中国已经成为全球第一大二氧化碳排放国。在应对全球气候变暖的问题上，中国以无可争议的排放增量首当其冲。现阶段中国面临着二氧化碳减排的巨大压力，迫切需要从低碳视角重新审视中国经济增长问题。

本文基于不同切入点，采用不同的经济学模型逐步剖析现阶段中国经济增长和二氧化碳排放问题，主要回答了以下几个问题：二氧化碳排放与现阶段经济增长的关系如何？低碳约束下的全要素生产率变动趋势怎样？与碳排放相关的阶段性特点对中国经济增长的影响如何？中国工业部门的要素配置效率与节能潜力是多少？中国对外贸易结构与二氧化碳排放关系如何？如何在保证经济增长前提下完成碳减排目标？

主要的研究结论有以下几点：

1、中国还正处在二氧化碳环境库兹涅茨曲线“拐点”的左侧，设定以碳强度作为现阶段的减排目标符合经济增长的要求。

2、碳强度目标与全要素生产率的变动趋势相吻合，改善碳强度，可以对生产率的提高产生激励。西部地区不存在追赶发达地区的趋势，效率变化对生产率提高的作用有限。

3、城市化、产业结构与能源效率对全要素生产率的影响都是正向且积极的。能源效率对全要素生产率的影响系数不断减小，说明在节能减排上做出巨大努力的同时也付出了一定的经济代价，必须配合节能目标约束以及政策的引导与支持。

4、得益于“十一五”约束性能源强度目标的坚定推行与工业要素市场化改革的不断深入，工业全行业要素配置效率在 2006 年由负转正，要素配置扭曲减

小。能源要素正在从低效行业向高效行业流动，能源密集型行业具有较大的节能潜力。

5、按中国目前的对外贸易结构特点，20%左右的内涵碳随着产品净输出至国外，以加工贸易为主的机械设备制造业和纺织品制造业是内涵碳净流出的主要部门，而内涵碳净进口的部门主要是采掘业。

6、二氧化碳增量主要是由经济增长造成，收入因素的正向贡献占到了绝对重要的位置。经济增长速度与方式的选择，对碳强度目标的完成程度有一定影响。改善能源强度，尤其是“十二五”能源强度目标完成情况，对2020年碳强度目标的实现非常重要。

**关键词：** 低碳经济；经济增长；全要素生产率

## Abstract

Ensuring a fast economic growth plays a critical part in China's macroeconomic area. In 2011, China's per capita GDP was more than 4000 US dollars. China is in the period to leap over the "middle-income trap". Although the urbanization process could be a major factor to promote economic growth, the urbanization stage characteristics such as heavy industry structure, rigid energy demand growth, relative low energy efficiency and coal dominated energy structure are great challenges in the current process of economic growth.

If there was no climate concerns related to carbon dioxide emissions, China would experience the same problems as developed countries once encountered. However, in the first decade of the 21st century, China's carbon dioxide emissions doubled, and China became the world's largest emitter of carbon dioxide. Currently, under the pressure of carbon emissions reduction, we urgently need to study China economic growth issue from a low carbon perspective.

From various viewpoints, this paper uses different economic models for analyzing China's economic growth and carbon dioxide emissions, and mainly concerns the following issues: the relationship between China's economic growth and carbon dioxide emissions, the trend of total factor productivity changes under low carbon constraint, the impacts of the stage characteristics related to carbon emissions on China's economic growth, the factor allocation efficiency and energy saving potential in China's industrial sectors, the relationship between China's foreign trade structure and carbon dioxide emissions, and how to realize carbon emissions reduction under the premise of economic growth.

Main conclusions are as follows:

1. China is still on the left side of carbon dioxide Environmental Kuznets Curve's inflection point. Thus it is reasonable to take carbon intensity as the target for reducing carbon dioxide emissions.

2. Carbon intensity target is consistent with the trend of total factor productivity

changes so that improving carbon dioxide emissions is helpful to promote the productivity. There is no signal indicating that western region are catching the developed region in China and the impacts of efficiency on productivity improvement are limited.

3. Total factor productivity is beneficial from urbanization, industrial structure and energy efficiency. The coefficient of influence that energy efficiency has on total factor productivity is continually decreasing, illustrating that it takes a certain economic cost while implementing measures for saving energy and reducing carbon dioxide emissions. Therefore, the energy efficiency target constraint and supplemental policy are also important in this process.

4. Due to the implementation of binding energy intensity target and the market-oriented reform of industrial factor during the 11th Five-Year, the industrial total factor allocation efficiency turned out to be positive in 2006, and factor allocation distortion is alleviated. Energy factor is gradually moving from low efficiency industry to high efficiency industry. Energy intensive industries have larger energy saving potential.

5. According to China's current international trade structure characteristics, 20% carbon emissions embodied in products are transferred abroad through exportation. The machine and equipment manufacturing industry and the textile industry which mainly engage in processing trade are the major sectors that export embodied carbon emissions. And the net import sector of carbon emissions is the mining industry.

6. The carbon dioxide emissions are derived from the economic growth, of which the increasing income contributes most. The rate and pattern of economic growth have a certain impact on carbon intensity target performance. Improving energy intensity, especially during the 12th Five-Year, plays a vital role in the completion of carbon intensity target in 2020.

**Key Words:** Low Carbon Economy; Economy Growth; Total Factor Productivity



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